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PATENT APPLICATION
MO-6806
MD-99-39B-PU

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION OF	
KEITH G. SPITLER ET AL	GROUP NO.: 1711
SERIAL NUMBER: 10/074,752	EXAMINER: J. COONEY
FILED: FEBRUARY 13, 2002	
TITLE: A PROCESS FOR MAKING CELLULAR COMPOSITES USING POLYMERIC ISOCYANATES AS BINDERS FOR HOLLOW FILLER PARTICLES	

LETTER

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Enclosed is an Appeal Brief in the matter of the subject Appeal. Please charge the fee for filing the Brief, $500.00, to our Deposit Account Number 13-3848. Triplicate copies of this paper are enclosed.

Respectfully submitted,

By _____
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I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an enveloped addressed to: Commissioner for Patents, Alexandria, VA 22313-1450 October 13, 2006
Date
N. Denise Brown, Reg. No. 36,097
Name of applicant, assignee or Registered Representative
_____
Signature
October 13, 2006
Date

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APPEAL BRIEF

This Brief is an appeal from the Final Office Action of the Examiner dated May 17, 2006, in which the rejection of Claims 1, 4-9 and 11 was maintained. A Notice of Appeal was filed on August 14, 2006.

I. REAL PARTY IN INTEREST

This application is assigned to Bayer MaterialScience LLC. The original assignment of this application was to Bayer Corporation. On May 12, 2003, the assignment of the present application was transferred from Bayer Corporation to Bayer Polymers LLC. Finally, on September 14, 2004, the assignment of the present application was transferred from Bayer Polymers LLC to Bayer MaterialScience LLC. Thus, Bayer MaterialScience LLC is the real party in interest.

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner for Patents, Alexandria, VA 22313-1450 October 13, 2006
Date
N. Denise Brown, Reg. No. 36,097
Name of applicant, assignee or Registered Representative
Signature
October 13, 2006
Date

II. RELATED APPEALS AND INTERFERENCES

There are no pending appeals or interferences which Appellants' are aware of that may be related to, would directly affect, would be affected by or have a bearing on the Board's decision in this appeal.

III. STATUS OF CLAIMS

The above-referenced application was filed with Claims 1-9.

Claims 2 and 3 were cancelled in an amendment filed November 18, 2004. New Claim 10 was added by amendment on May 24, 2005. In an amendment filed on October 3, 2005, Applicants cancelled Claim 10 and added new Claim 11.

Claims 1, 4-9 and 11 are pending but stand rejected. Claims 1, 4-9 and 11 are the subject claims of this appeal.

IV. STATUS OF AMENDMENTS

No amendments were filed by Appellants' after the final rejection dated May 17, 2006.

V. SUMMARY OF CLAIMED SUBJECT MATTER

Of pending Claims on Appeal, Claim 1 is the only independent Claim. Claims 4-9 and 11 are directly dependent on Claim 1.

Claim 1 is directed to a process for the production of a cellular composite. (In order to assist the Honorable Board in its evaluation of the invention, reference will be made to the specification in which "P" will designate a page number and "L" will designate the line number(s)). This process consists of (A) preparing a reaction mixture, (B) adding the mixture formed in (A) to (3) an inorganic component consisting of inorganic hollow microspheres under low shear mixing, (C) completely filling a mold with the mixture formed in (B), and (D) heating the filled mold at a

temperature of from 100 to 280°C, thereby reacting the polyisocyanate and water to form a polyurea which binds the hollow microspheres, and thus forms a cellular composite. (See P2, L9-13 and L16-18; P7, L5-13.) The reaction mixture formed in (A) consists of (1) a polyisocyanate and (2) water (see P7, L15-16; P8, L27-29), with water being present in an amount such that there is an excess of from 2 to 5 times the stoichiometric quantity required based on the NCO group content of the polyisocyanate (see P5, L30 through P6, L2). In step (B), the quantity of reaction mixture from (A) ranges from 20 to 38.5% by weight (see Examples 1 and 5 which supports this lower limit, and Examples 4 and 8 which supports this upper limit), and the quantity of hollow microspheres ranges from 61.5 to 80% by weight (see Examples 4 and 8 which support this lower limit, and Examples 1 and 5 which support this upper limit), with the sum of the percents by weight totaling 100% by weight of the cellular composite.

Claim 4, which is dependent on Claim 1, further requires that (D) the heating is at a temperature of from 125 to 150°C. See P7, L9.

The process of Claim 5 requires that (B)(3) the inorganic hollow microspheres are selected from the group consisting of glass, silicates, borosilicates, ceramic, fly-ash and mixtures thereof. See P 5, L23-25. Claim 5 is also dependent on Claim 1.

Claim 6, which is also dependent on Claim 1, further specifies that (A)(1) the polyisocyanate is characterized by an NCO group content of 25 to 35% by weight, and a functionality of from 2.0 to 3.5, a viscosity of less than about 500 mPa·s at 25°C, and is selected from the group consisting of aromatic polyisocyanates, and adducts and mixtures thereof. See P5, L4-9.

Claim 7 specifies that (A)(2) the water is present in an amount such that there is an excess of from 3 to 4 times the stoichiometric quantity required based on the NCO group content of (A)(1) the polyisocyanate. See P6, L2-4. Claim 7 is also dependent on Claim 1.

Claim 8 requires that the heating step (D) in the process of Claim 1 continue from 0.5 to 60 minutes. See P 7, L9-10.

Claim 9 is directed to the cellular composite product by the process of Claim 1. See P2, L10.

Claim 11 requires that (A)(1) the polyisocyanate of Claim 1 consists of polymethylene poly(phenylisocyanate) and is characterized by an NCO group content of 29 to 33% by weight, and a functionality of from 2.0 to 3.0. See P5, L10-13.

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Claims 1, 4-9 and 11 stand rejected under 35 U.S.C. § 112, first paragraph, for failure to comply with the written description requirement.

Claims 1, 4-9 and 11 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over EP 0005903 in view of U.S. Patent 6,284,809.

VII. ARGUMENTS

CLAIMS 1, 4-9 AND 11 ARE NOT PROPERLY REJECTED UNDER 35 U.S.C. § 112, FIRST PARAGRAPH, FOR FAILURE TO COMPLY WITH THE WRITTEN DESCRIPTION REQUIREMENT.

Appellants respectfully submit that the written description requirement of the first paragraph of 35 U.S.C. § 112 is satisfied by the presently claimed invention.

It is well established that the purpose of the written description requirement of the first paragraph of 35 U.S.C. § 112 is to ensure that Appellants were in possession of the claimed invention at the time the application was filed (i.e. as of the filing date). This requirement is satisfied if the application reasonably conveys this fact to one of ordinary skill in the art.

In the final Office Action dated May 17, 2006, the Examiner expressly states that this is a "new matter" rejection. See page 2 of the final Office Action, last paragraph, last sentence therein.

This rejection relates specifically to the relative ranges of reaction mixture formed in step (A) and the hollow microspheres that are added together in step (B) of Appellants' claimed process. More specifically, the claimed invention requires the mixture formed in (A) to be present an amount of from 20 to 38.5% by weight, and the hollow microspheres to be present in an amount of from 61.5 to 80% by weight, with the sum of these percents by weight totaling 100% by weight of the cellular composite.

Appellants respectfully submit that the application as filed on February 13, 2002 provides reasonable support for the amounts of reaction mixture and hollow microspheres which are now being claimed. Therefore, the specification provides a proper written description of the claimed invention and the "new matter" rejection is improper.

More specifically, the claimed invention requires that the reaction mixture consisting of polyisocyanate and water be present in an amount of 20 to 38.5% by weight, and the hollow microspheres be present in an amount of from 61.5 to 80% by weight, with the sum of these percents by weight totaling 100% by weight of the cellular composite. In the working examples of the present application, Examples 1 and 5 provide support for the embodiment in which the reaction mixture of polyisocyanate and water is present in an amount of 20% by weight and the hollow microspheres are present in an amount of 80% by weight. Examples 4 and 8 provide of the present application provide support for the embodiment of the invention in which the reaction mixture of polyisocyanate and water is present in an amount of 38.5% by weight and the hollow microspheres are present in an amount of 61.5% by weight. Thus, Appellants respectfully submit that working Examples 1, 4, 5 and 8 of the specification support both the presently claimed upper and lower limits of the required components.

In addition, the remaining examples of the present specification provide support for embodiments within the claimed ranges. In particular, Examples 2 and 6 support an embodiment in which the reaction mixture of polyisocyanate and water is present in an amount of 27% by weight and the hollow microspheres are present in an amount of 73% by weight; and Examples 3 and 7 support an

embodiment in which the reaction mixture of polyisocyanate and water is present in an amount of 33% by weight and the hollow microspheres are present in an amount of 67% by weight.

Appellants respectfully submit that in light of the working examples set forth in the application as filed, it is readily apparent to one of ordinary skill in the art that (1) no new matter has been added by the amendment, and (2) Appellants' were in possession of presently claimed invention as of the filing date of the application. Thus, the present specification satisfies the written description requirement of 35 U.S.C. § 112, first paragraph. It is also submitted that the original specification supports the invention as now claimed and no new matter has been added.

The written description requirement does not require Appellants to provide express written support for each and every possible combination of the invention that may be claimed. Rather, the written description requirement is intended to ensure that Appellants were in possession of the invention at the time of filing the application. Since the examples which Appellants have relied on for support of their February 14, 2006 amendment were present in the application at the time it was filed in the United States Patent and Trademark Office, there is no basis for this rejection. It is readily apparent that prior to the February 14, 2006 amendment, the Examiner did not believe any of the pending claims were too broad, lacked an adequate written description or were not enabled by the present application and the same working examples, as no such rejections were made during the prosecution thus far.

It now appears to be the Examiner's position that Appellants can only present claims for which the specification provides express literal support for each of the features claimed in combination with each other. It is respectfully submitted that this is improper.

Requiring an applicant for patent to only claim subject matter which the specification provides express literal support for would significantly increase the size of patent applications. Such a requirement would force each applicant to expressly disclose as many variations and/or embodiments of their claimed invention as possible to ensure the written description requirement was satisfied for each and

every possible variation and/or embodiment that they may (at some point in time) want to claim. This is not, however, what is required by the law!

Rather, the written description of the first paragraph of 35 U.S.C. § 112 is satisfied by a specification which reasonably supports the fact that an applicant was in possession of the invention at the time the patent application was filed. One of ordinary skill in the art would have no doubt that Appellants were in possession of the invention as it now claimed at the time their patent application was filed. The specification in its entirety provides reasonable support that the invention as now claimed was in Appellants' possession at the time they filed the present application. Thus, the written description requirement of the first paragraph of 35 U.S.C. § 112 is completely satisfied by Appellants' specification. It is respectfully submitted that this rejection is improper and requested that it be withdrawn.

Appellants maintain their position that the February 14, 2006 amendment does not introduce new matter into the present application. The presently claimed ranges for the quantity of mixture formed in (A) and the hollow microspheres are clearly supported by the original specification. Therefore, these ranges do not introduce new matter into the application.

There is simply no legal basis for requiring Appellants to only claim those embodiments of their invention for which their specification literally provides express written support. Appellants are properly entitled to claim numerous variations of their invention, provided the specification reasonably supports these variations. It is respectfully submitted that Appellants have not randomly selected the presently claimed range. Rather, this range is clearly supported by the original working examples. Thus, one of ordinary skill in the art upon reading the present specification would reasonably believe that Appellants were in possession of the invention now being claimed. Appellants respectfully submit that the written description requirement of 35 U.S.C. § 112, first paragraph, is satisfied by the present specification and claims.

It is respectfully submitted that this new matter rejection and/or written description rejection are improper. Appellants request that this rejection be withdrawn.

CLAIMS 1, 4-9 AND 11 ARE NOT PROPERLY REJECTED UNDER 35 U.S.C. §103(A) AS BEING UNPATENTABLE OVER EP 0005903 (THE WOOLER ET AL REFERENCE) IN VIEW OF U.S. PATENT 6,284,809 (THE PLUMMER ET AL REFERENCE)

Appellants respectfully submit that the presently claimed invention is not properly rejected as being unpatentable over the EP 0005903 reference combined with U.S. Patent 6,284,809. The presently claimed process for the production of a cellular composite is not suggested to one of ordinary skill in the art upon reading the Wooler et al reference with the Plummer et al reference.

These references lead the skilled artisan to combine both the process of preparing polyurea rigid foams of the Wooler et al reference with the microspheres and the minispheres of the Plummer et al reference. The process of the Wooler et al reference comprises reacting an organic polyisocyanate, with at least a chemically equivalent amount of water, in the presence of a catalyst, and a fire retardant selected from triaryl phosphates and/or aromatic halogen compounds. (See column 1, lines 26-31 of the Wooler et al reference.) The foam compositions of the Plummer et al reference comprise a resin binder containing a mixture of hollow microspheres and hollow minispheres. This combination is essential to achieve the desired foam properties of a thermal conductivity of less than 0.120 watts/meter-°K, and acceptable strength and buoyancy for subsea applications. (See column 2, lines 29-34.)

Appellants respectfully submit that one of ordinary skill in the art upon reading the Wooler et al reference and the Plummer et al reference would "arrive at" a process of preparing polyurea foams by reacting an organic polyisocyanate, with at least a chemically equivalent amount of water, and both hollow microspheres and hollow minispheres from the Plummer et al reference, in the presence of a catalyst and a fire retardant. This is not the presently claimed invention. Therefore, the presently claimed invention is not properly rejected as being obvious in view of the combination of references.

It is evident that the Plummer et al reference requires both hollow microspheres and hollow minispheres to achieve the desired properties therein. Appellants therefore submit that one of ordinary skill in the art seeking to combine this reference with the process of the Wooler et al reference would not be motivated to add only the hollow microspheres or the hollow minispheres. Rather, the skilled artisan would add both hollow microspheres and hollow minispheres to the process of the Wooler et al reference. The Plummer et al reference clearly contributes improvements in buoyancy and insulative capacity to composition, density and volume filling of hollow spheres (column 1, lines 49-50). The volume filling of hollow spheres is described as a function of sphere density and packing factor (column 1, lines 51-61). It is further disclosed by this reference that packing factors can be improved by using a combination of two different types of hollow spheres which differ in size by a minimum factor (column 1, lines 62-64). The synthetic foam compositions of this reference comprise a resin binder with a mixture of both hollow microspheres and hollow minispheres (column 2, lines 28-34).

Appellants respectfully submit that there is no support for the position that one skilled in the art would be motivated to only add the hollow microspheres from the Plummer et al reference to the process of producing a polyurea foam of the Wooler et al reference, and thus, "arrive at" the presently claimed invention. The present claims clearly use "consisting of" language. Thus, the addition of both hollow microspheres and hollow minispheres from the secondary reference (U.S. 6,248,809) to the primary reference (EP 005903) does not result in the presently claimed invention. Nor does it properly render the present claims obvious to one of ordinary skill in the art.

Only after reading the present specification does it become "obvious" to only add hollow microspheres of the Plummer et al reference to the process of the Wooler et al reference. Such a perspective does **not**, however, provide a proper basis for a rejection of the presently claimed invention under 35 U.S.C. § 103(a).

The Examiner is clearly relying on hindsight knowledge gained from the present application to modify the references in the necessary manner to arrive at the presently claimed invention. This is clearly improper.

Furthermore, this combination of references does not suggest to one of ordinary skill in the art that the mixture of components forming the cellular composite should be (A) from 20 to 38.5% by weight of polyisocyanate and water, and from 61.5 to 80% by weight of hollow microspheres, with the sum of these totaling 100% by weight of the cellular composite. Since the Wooler et al reference is silent with respect to hollow microspheres or any other type of "reinforcing fiber" and/or "filler" it obviously does not provide any information concerning the relative amounts of these hollow microspheres to the skilled artisan. The Plummer et al reference discloses in Claim 1 that the foam compositions therein comprise 21 to 24 volume % of a hardened resin, 14 to 21 volume % of microspheres and from 55 to 60 volume % of minispheres, based on the total volume of the foam. Appellants do not believe sufficient information is provided by this reference to calculate weight %%'s from these volume %'s. Accordingly, the information provided to the skilled artisan by the Plummer et al reference is, at best, inconclusive with regard to the relative amounts of resin, microspheres and minispheres that should be present.

Appellants therefore submit that one of ordinary skill in the art upon reading the Wooler et al reference and the Plummer et al reference would not be motivated to combine these disclosures in the necessary manner to "arrive at" the presently claimed invention. It is apparent that the combination suggested by these references is not that which Appellants are claiming. Accordingly, the presently claimed invention is not properly rejected under 35 U.S.C. § 103(a).

In view of the preceding arguments, Appellants' respectfully submit that the Examiner's rejection is in error and respectfully request that the rejection be reversed. The allowance of Claims 1, 4-9 and 11 is respectfully requested.

Respectfully submitted,

By _____

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VIII. CLAIMS APPENDIX:

The following is a listing of the claims on Appeal.

Claim 1. A process for the production of a cellular composite consisting of:

(A) preparing a mixture consisting of (1) a polyisocyanate and (2) water, wherein said water is present in an amount such that there is an excess of from 2 to 5 times the stoichiometric quantity required based on the NCO group content of said polyisocyanate;

(B) adding the mixture formed in (A) to (3) an inorganic component consisting of inorganic hollow microspheres under low shear mixing, in which the amount of mixture formed in (A) is from 20 to 38.5% by weight and the amount of hollow microspheres is from 61.5 to 80% by weight, with the sum of the %'s by weight totaling 100% by weight of the cellular composite;

(C) completely filling a mold with the mixture formed in (B);

and

(D) heating the filled mold at a temperature of from 100 to 280°C;

thereby reacting the polyisocyanate and water to form a polyurea which binds the hollow microspheres, thus forming a cellular composite.

Claim 4. The process of Claim 1, wherein (D) said heating is at a temperature of from 125 to 150°C.

Claim 5. The process of Claim 1, wherein (B)(3) said inorganic hollow microspheres are selected from the group consisting of glass, silicates, boro-silicates, ceramic, fly-ash and mixtures thereof.

Claim 6. The process of Claim 1, wherein (A)(1) said polyisocyanate is characterized by an NCO group content of from 25 to 35% by weight, and a functionality of from 2.0 to 3.5, a viscosity of less than about 500 mPa·s at 25°C, and is selected from the group consisting of aromatic polyisocyanates, and adducts and mixtures thereof.

Claim 7. The process of Claim 1, wherein (A)(2) said water is present in an amount such that there is an excess of from 3 to 4 times the stoichiometric quantity required based on the NCO group content of (A)(1) said polyisocyanate.

Claim 8. The process of Claim 1, wherein (D) said heating continues from 0.5 to 60 minutes.

Claim 9. A cellular composite produced by the process of Claim 1.

Claim 11. The process of Claim 1, wherein (A)(1) said polyisocyanate consists of a polymethylene poly(phenylisocyanate) and is characterized by an NCO group content of 29 to 33% by weight, and a functionality of from 2.0 to 3.0.

IX. EVIDENCE APPENDIX:

No evidence has been submitted by Appellants.

X. RELATED PROCEEDINGS APPENDIX:

Appellants' have not identified any applications under Section II, titled "RELATED APPEALS AND INTERFERENCES". Accordingly, there is nothing to submit under this section.